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Thanatosis in the Neotropical Butterfly *Caligo illioneus* (Nymphalidae: Brassolinae)

During the course of studies on flight kinematics in Neotropical butterflies, thanatosis (death-feigning behavior) was noticed in a female *Caligo illioneus*. The following observations were made in July 1987 in a small screened insectary on Barro Colorado Island, Republic of Panama. Mass of the insect was 1.84 g, the ambient air temperature was 27°C, and the relative humidity 88%. Ambient air motions in the insectary were negligible. Observations began with the butterfly at rest on an insectary wall with the wings folded together dorsally. When grasped by the base of the folded forewings and removed from the wall, the butterfly entered a thanatonic condition, characterized by complete absence of wing or leg motion, with the legs tucked against the body as in flight. When then placed upon (and with wings parallel to) a horizontal surface, the insect remained motionless. While in this condition, tactile stimulation of the wings, legs and body produced no behavioral response. Eventually the insect righted itself and flew away; in eight consecutive trials each separated by several minutes, the mean time to self-righting was 55 seconds (s.d. = 49 s). Dropping the thanatonic insect upside-down from a height of several meters resulted in a short vertical drop followed by wing-spreading and active flapping flight or gliding to the walls of the insectary.

Thanatosis has been observed in a variety of animals, including numerous beetles (Bleich, 1928), mantids (Edmunds, 1972), moths (Blest, 1964), snakes (Gehlbach, 1970; see also Greene, 1988) and mammals (e.g. Francq, 1969; Ewer, 1966). It has been suggested that thanatosis induces relaxation of predator attention, possibly allowing for active escape of the prey during the handling phase of a predatory event (Ratner & Thompson, 1960). Butterflies are frequently attacked by insectivorous birds. Chai (1986) reported that the jacamar *Galbula ruficauda*, a specialized avian predator of flying insects, required on average 9 minutes (maximally 40 minutes) to strip large butterflies of their wings prior to consumption of the body. Wing-stripping by jacamars occurs upon the cessation of struggle by the butterfly. If thanatosis on the part of butterflies does induce momentary inattention during the wing-stripping procedure, possibilities for escape are heightened. Additionally, death-feigning may be an advantageous defense, following an initial unsuccessful attack, against predators which only attack moving prey. Curiously, thanatosis involves an inhibition of wing flapping concurrent with an absence

of tarsal contact with a substrate. In general, loss of tarsal contact initiates wing flapping responses in insects (see Chapman, 1971). Neural reflexes which ordinarily would initiate flight must therefore be facultatively suppressed during the thanatonic condition.

It was unfortunately not possible to obtain additional specimens of *Caligo illioneus* to evaluate in detail various physiological and behavioral aspects of thanatosis. However, the present results are unlikely to be anomalous, as DeVries (*pers. comm.*) has observed thanatosis in three papilionid species (*Parides arcas, P. childrenae*, and *P. erithalion*), in a *Lycorea* sp. (Danainae), and in several ithomiine genera. Thanatosis may thus be a widespread anti-predatory defense in tropical butterflies.

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A New Specimen of *Vanessa braziliensis* "ab. *dallasi*" (Nymphalidae) from Argentina

Vanessa braziliensis (Moore) "ab. *dallasi*" was described and figured by Koehler (1945, p. 256; pl. 20, fig. 2). The "cotypes" (apparently at least two specimens) are stated to be from the Sierra de Ambato, Province of Catamarca, Argentina, at 2000 meters. In addition to the color plate, I have examined the "cotype" in the Breyer collection at the Museo de La Plata. The labels of the "cotypes" of this and *Vanessa carye* "ab. *bruchi*," described in the same paper,